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(54) Working member for ripper drums on heavy vehicles for removing ground, equipped with quick release tool and toolhead

(57) A working member (1) for ripper drums (T) of heavy vehicles for removing ground comprising: a support base (2) provided with a toolhead (4) having a longitudinal hole (5) through it and a through transversal hole (6) that intersects said longitudinal hole (5). A ripper tool (7) coupled to said toolhead, consists of a working section (8) protruding from the toolhead (4), made at the end of a shank (9) mounted in the longitudinal hole (5) of the toolhead (4). The transversal hole (6) divides the body of the toolhead (4) into a first section (10) that is held in its corresponding seat (3) of the support base (2) and a second section (11) that receives the shank (9) of said ripper tool (7). The transversal hole (6) has a straight region (6') that undercuts the seat (3) of the support base (2) when the first section (10) of the toolhead (4) is coupled into its respective seat (3) of the support base (2).

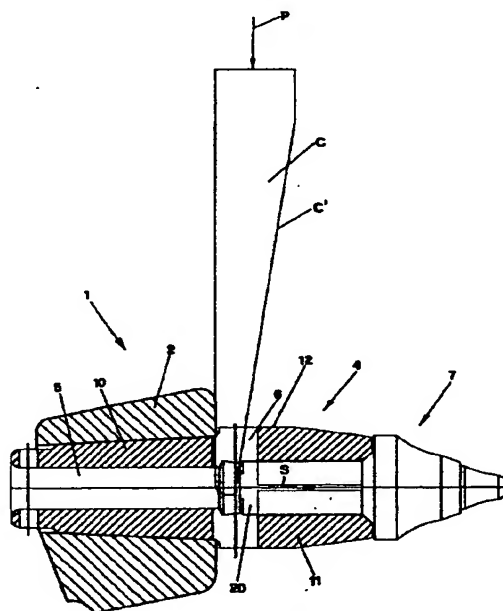


FIG. 1

Description

[0001] The invention concerns a working member for ripper drums on heavy vehicles for removing ground, especially scarifier machines equipped with quick release tool and toolhead.

[0002] It is known that to remove ground special heavy vehicles called scarifiers are used, which are equipped with a ripper drum having a series of working members that, as the ripper drum rotates, break up the ground as they come into contact with it.

[0003] In known products each working member is made up of a support base fixed to the cylindrical core that makes up the ripper drum, which has a toolhead where a ripper tool is extractably pressure mounted.

[0004] With regards to the toolhead, this is extractably coupled into a corresponding seat made out of the support base and has a longitudinal hole through it where the shank of the ripper tool is inserted.

[0005] The toolhead, in particular, is mounted by passing it into the seat of the support base that holds it with the opposite end to where the ripper tool is applied protruding from the actual support base.

[0006] When the toolhead has to be removed from its respective support base, the protruding end is struck until the toolhead slides out of the seat that is holding it.

[0007] In a similar way, if the ripper tool has to be separated from the toolhead, a pushrod is inserted into the longitudinal hole of the latter, which is used to axially force the shank of the ripper tool until it comes away from the toolhead.

[0008] These dismantling operations become necessary when the ripper drum is serviced, for instance to change toolheads and sometimes even to change worn or broken tools.

[0009] One of the problems that arises when the toolheads and their respective tools have to be extracted by percussion, is that it is not always easy to work with a means of percussion, for example a hammer or mallet, from behind the support bases, since the working members on the ripper drum are often arranged so tightly together that this is not possible.

[0010] More often than not, this operation is particularly impracticable on the working members mounted at the edges of the ripper drum where there is a marked concentration of working members because of the presence of members that, in addition to removing the ground, also have to define the outer edge of the excavation.

[0011] In an attempt to eliminate these inconveniences, there are known working members where the toolhead has a transversal hole where a wedge is hammered that forces against the tool's shank and slides it out of the toolhead that is holding it.

[0012] Toolheads constructed in this way are described for instance in the patent for industrial invention having deposit number V196A000126 registered in name of the same deposittee as this invention.

[0013] However even the working members and especially the toolheads described in said patent have the inconvenience that their transversal hole only allows to extract the tool from its toolhead but not the toolhead from its support base. So in conclusion, for the toolhead to be extracted, it nevertheless has to be hammered from behind the support base.

[0014] This invention intends to overcome the aforementioned inconveniences.

[0015] In particular, a first scope of the invention is to produce a working member for ripper drums of heavy vehicles for removing ground that allows to extract the toolhead from the support base that holds it without having to hammer it out from behind the actual toolhead.

[0016] Another scope is that the same operation that allows the toolhead to be extracted from its support base, also allows the ripper tool to be extracted from the toolhead that is holding it.

[0017] Last but not least a scope is that by means of a single extracting action, it is possible to extract the ripper tool without necessarily having to remove the relevant toolhead as well.

[0018] Said scopes and advantages are achieved by the production of a working member for ripper drums of heavy vehicles for removing ground that, in accordance with the main claim, comprises:

- a support base fixed to the outside of the cylindrical core of said ripper drum;
- at least one toolhead extractably coupled in a corresponding seat made in said support base and having a longitudinal hole through it that creates a longitudinal axis and a through transversal hole that intersects said longitudinal hole;
- a ripper tool coupled to said toolhead and consisting of a working section protruding from the actual toolhead, made at the end of a shank extractably mounted in said longitudinal hole of the toolhead and characterised in that said transversal hole divides the body of said toolhead into a first section that is held in its corresponding seat of said support base and a second section that receives the shank of said ripper tool, said transversal hole having a straight region that undercuts said seat of said support base when said first section of said toolhead is coupled into its respective seat of said support base.

[0019] One advantage of using the working members described in this invention is that it speeds up maintenance on the ripper drums they are applied to. Said scopes and advantages will be better explained during the description of a preferred form of execution of the invention, which refers to the attached diagrams, where:

- fig. 1 shows the working member invention;

- fig.'s 2 and 3 show the working member in fig. 1 while extracting the ripper tool;
- fig. 4 shows the working member in fig. 1 while extracting the toolhead.

[0020] As can be seen in fig. 1, the working member invention, generally indicated by 1, is applied to a ripper drum, generally indicated by T, designed for removing ground and therefore suited to being applied to a scarifier.

[0021] The working member 1 comprises a support base 2 fixed to the cylindrical core A of ripper drum T, provided with a seat 3 where a toolhead, generally indicated by 4, is extractably coupled.

[0022] The toolhead 4 has a longitudinal hole 5 through it that creates a longitudinal axis X and a through transversal hole 6 that intersects the longitudinal hole 5. One end of the toolhead 4 holds a ripper tool, generally indicated by 7, which consists of a working piece 8 that protrudes from the toolhead 4 and is made at the end of a shank 9 extractably mounted in the longitudinal hole 5.

[0023] According to this invention the transversal hole 6 divides the body of said toolhead 4 into a first section 10 suited to being received in the corresponding seat 3 of said support base 2 and into a second section 11 suited to receiving the shank 9 of said ripper tool 8, said transversal hole 6 having a region 6' that is held in said seat 3 of said support base 2 when said first section 10 of said toolhead 4 is coupled in its respective seat 3 of said support base 2.

[0024] The first section 10 and second section 11 where the transversal hole 6 divides the toolhead 4, have a circular cross-section and tapering cylindrical profiles 10', 11' having their tapering in opposite directions and towards their respective ends.

[0025] The first section 10 and the second section 11 are linked together by a basically cylindrical, intermediary section 12 that comprises the longitudinal axis Y of the transversal hole 6.

[0026] An abutment 13 provided with junction 14 connects the intermediary section 12 of the toolhead to the first section 10, the latter having a smaller diameter than the former.

[0027] The transversal hole 6 that preferably but not necessarily has a circular section, has a generatrix 15 of its lateral surface, undercut and therefore recessed by distance 16 from the wall 17 of the support base 2 which has the hole that allows the first section 10 of the toolhead 4 to be inserted in its respective seat 3.

[0028] The length 18 of the second section 11 of toolhead 4 is shorter than the length 19 of the shank 9 of the ripper tool 8 so that the end section 20 of the actual shank 9 juts out into the transversal hole 6.

[0029] To release the ripper tool 7 and its respective toolhead 4 and the latter from its respective seat 3 in the support base 2 that holds it, two successive stages are required.

[0030] As can be seen in fig. 2, by inserting the wedge C into transversal hole 6, the wedge's sloping face C' comes into contact with the end section 18 of the shank 9 of ripper tool 7.

5 [0031] By applying a percussive force P along the same axis as the wedge C, a drive S is created in direction of axis of shank 9 that separates the tool 7 from its respective toolhead 4 until it is extracted, as can be seen in fig. 3.

10 [0032] By continuing with percussive force P on wedge C, its sloping face C', as can be seen in fig. 4, drives against the top rim 21 of the transversal hole 6, applying an axial force F, however this time on the toolhead 4 that is thereby forced to move in the same horizontal direction as axial force F, until it is extracted from its respective seat 3 that holds it.

15 [0033] It is clear that, in the event that only ripper tool 4 needs to be removed, it is sufficient to suspend application of the percussive force P on wedge C after having extracted the tool 7, as can be seen in fig. 3.

20 [0034] It is understandable that, according to the above explanation, the invention achieves the set scopes.

25 [0035] In particular, the extracting of the ripper tool and toolhead is achieved in a single manoeuvre and in sequence, acting with a wedge perpendicular to the longitudinal axis of the working member.

30 [0036] In this way separation of the tool and its relative toolhead can be achieved regardless of whether or not the back of the working members can be accessed with percussion devices, for instance hammers or mallets.

35 [0037] The ease of this operation makes dismantling and changing of tool and toolhead even quicker and easier to perform.

[0038] It is clear that the ripper tool and its relative toolhead can have any shape and size whatsoever and can be applied to any size of ripper drum.

40 [0039] What's more, concerning the toolhead's and tool's profiles, even these may be different to the examples illustrated and described in the attached diagrams.

45 [0040] It shall be understood that any variants in execution differing from those described and mentioned above, since they fall under the claims below, shall all be considered protected by this invention.

Claims

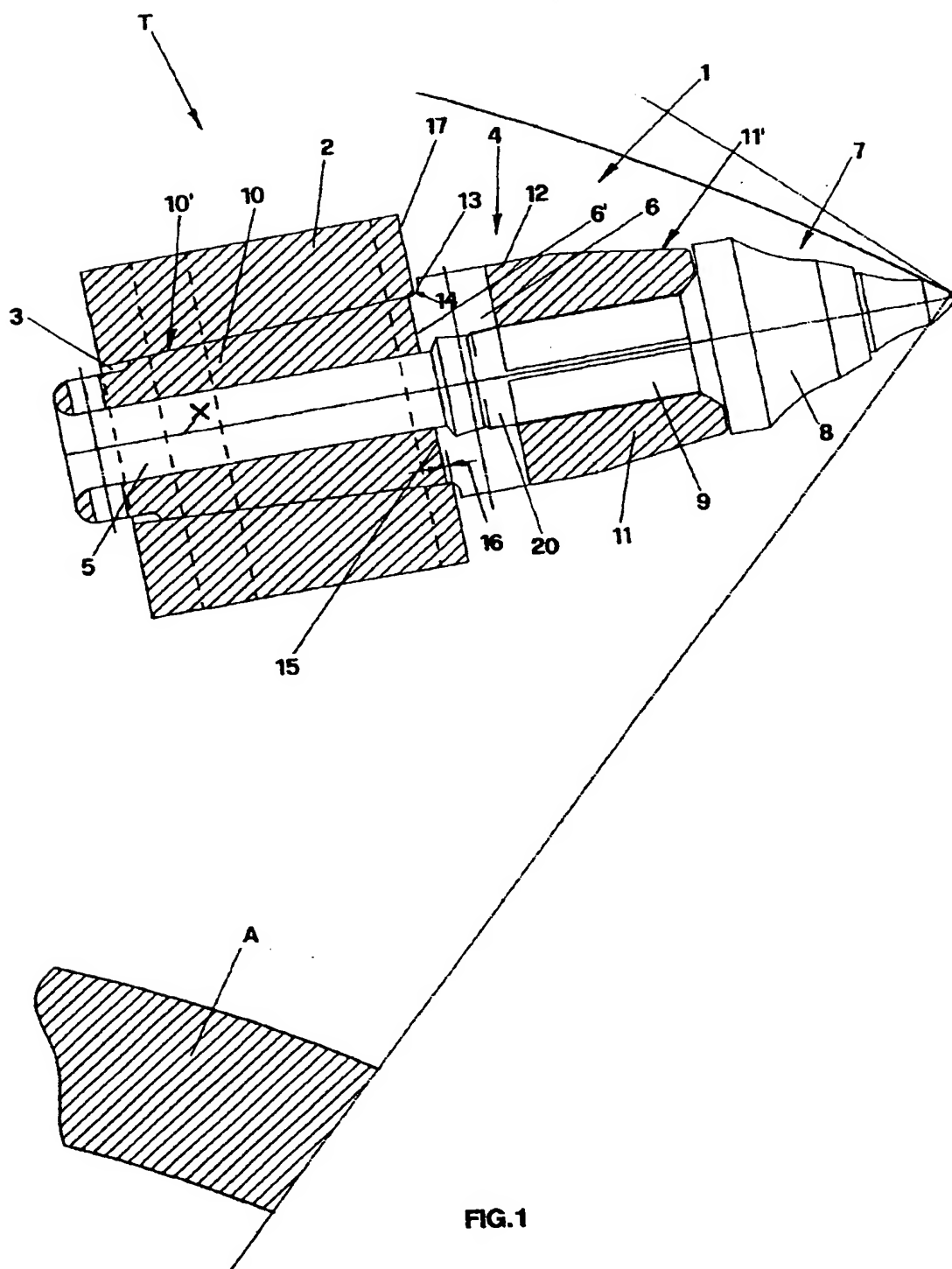
1. Working member (1) for ripper drums (T) of heavy vehicles for removing ground, comprising:

- a support base (2) fixed to the outside of the cylindrical core (A) of said ripper drum (T);
- at least one toolhead (4) extractably coupled in a corresponding seat (3) made in said support base (2) and having a longitudinal hole through it (5) that creates a longitudinal axis (X) and a through transversal hole (6) that intersects said

longitudinal hole (5);

- a ripper tool (7) coupled to said toolhead (4) and consisting of a working section (8) protruding from the actual toolhead (4), made at the end of a shank (9) extractably mounted in said longitudinal hole (5) of the toolhead (4),
characterised in that said transversal hole (6) divides the body of said toolhead (4) into a first section (10) that is held in its corresponding seat (3) of said support base (2) and into a second section (11) that receives the shank (9) of said ripper tool (7), said transversal hole (6) having a straight region (6') that undercuts said seat (3) of said support base (2) when said first section (10) of said toolhead (4) is coupled into its respective seat (3) of said support base (2).

2. Working member (1) according to claim 1) **characterised in that** the shank (9) of said ripper tool (7) is longer in length (19) than the length (18) of said second section (14) of said toolhead (4) so that an end section (20) of said shank (9) juts out into said transversal hole (6).
3. Working member (1) according to claim 1) **characterised in that** said first section (10) and said second section (11) of said toolhead (4) have a circular cross-section with tapering cylindrical profiles (10', 11') having their tapering in opposite directions and towards their respective ends.
4. Working member (1) according to claim 1) **characterised in that** said first section (10) and said second section (11) of said toolhead (4) are linked together by a basically cylindrical intermediary section (12) which comprises the longitudinal axis (Y) of said transversal hole (6).
5. Working member (1) according to claim 4) **characterised in that** said first section (10) has a greater diameter in said intermediary section (12), said sections (10, 12) being connected together by an abutment (13) provided with a junction (14) to said first section (10).



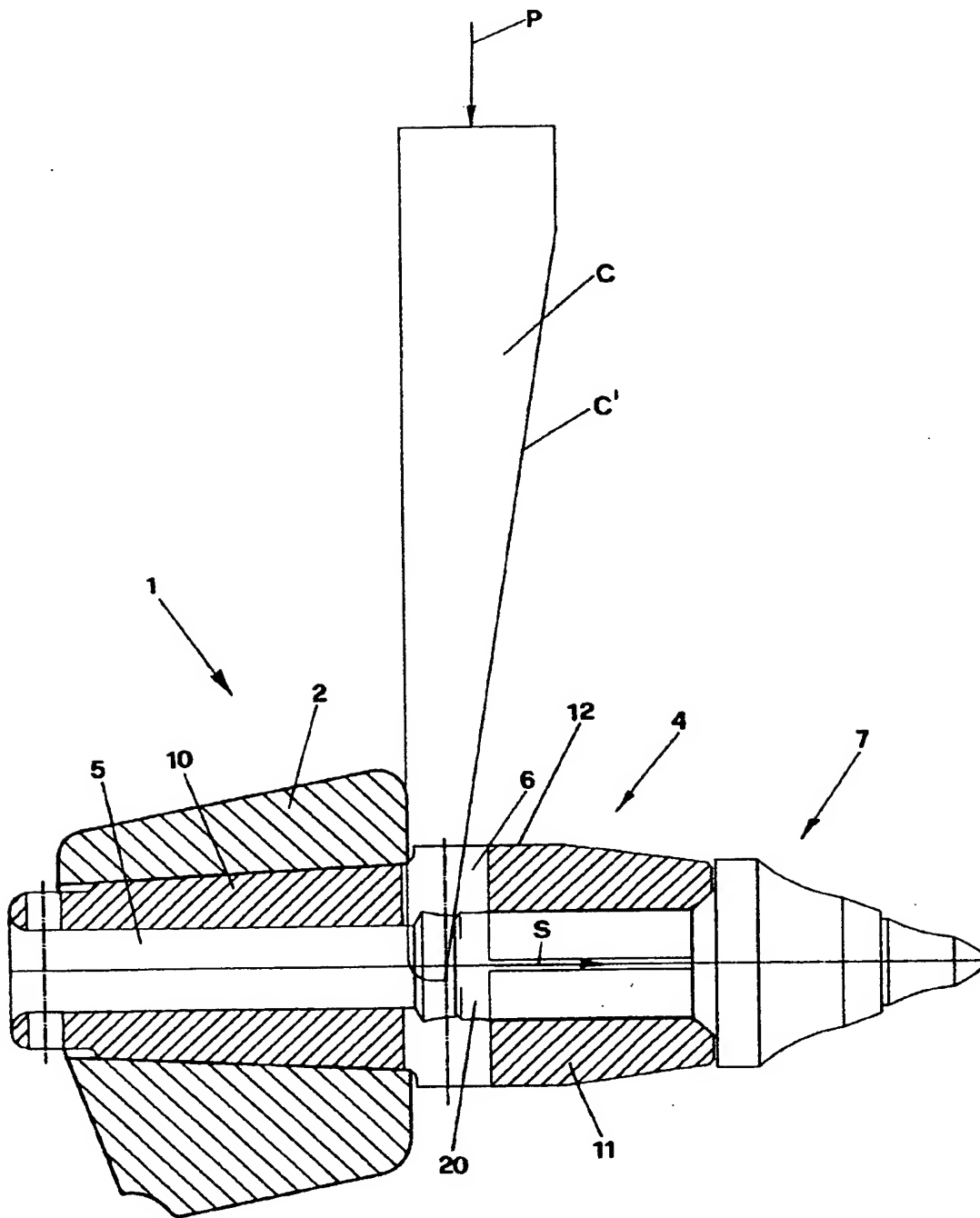


FIG.2

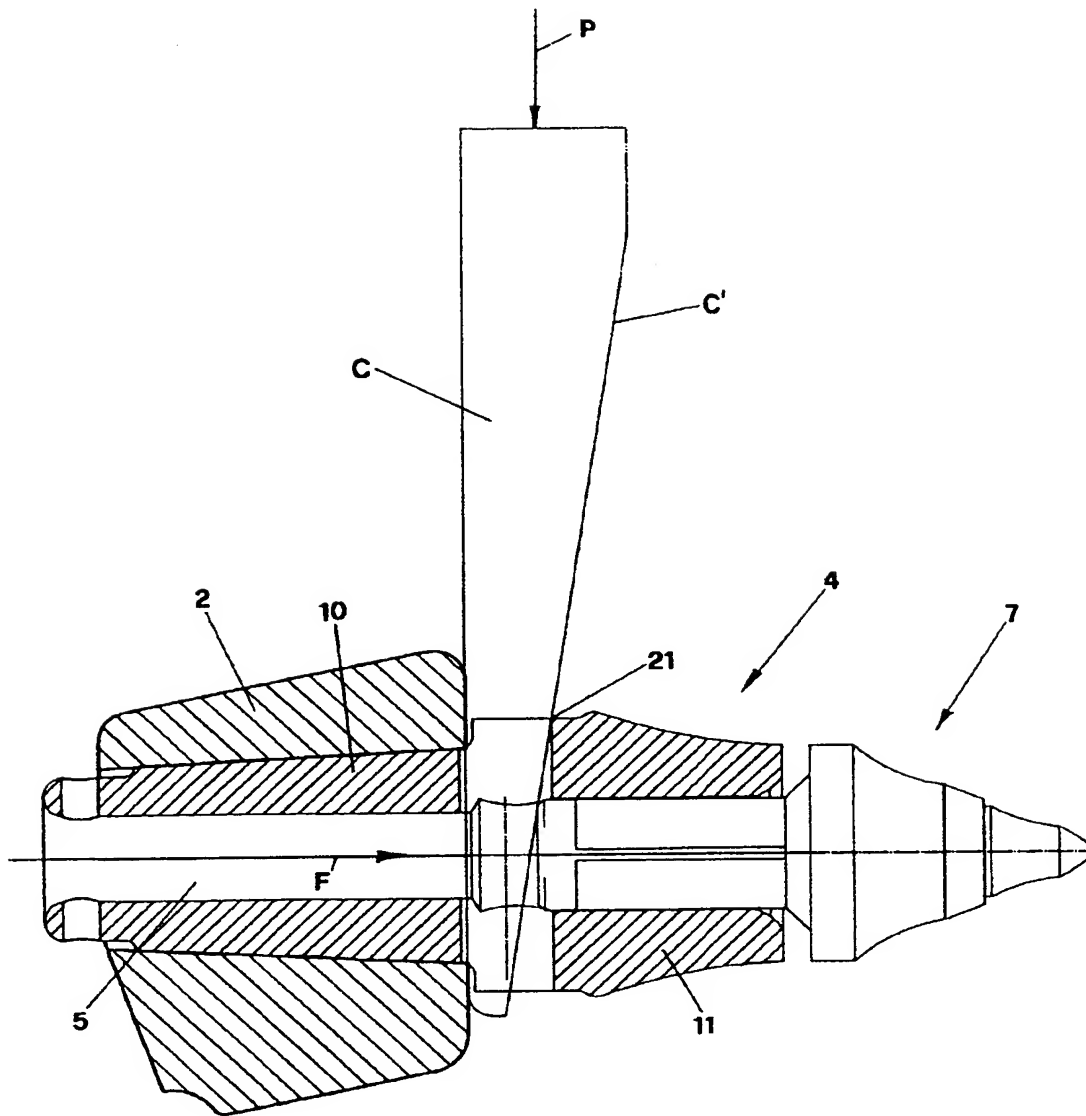


FIG.3

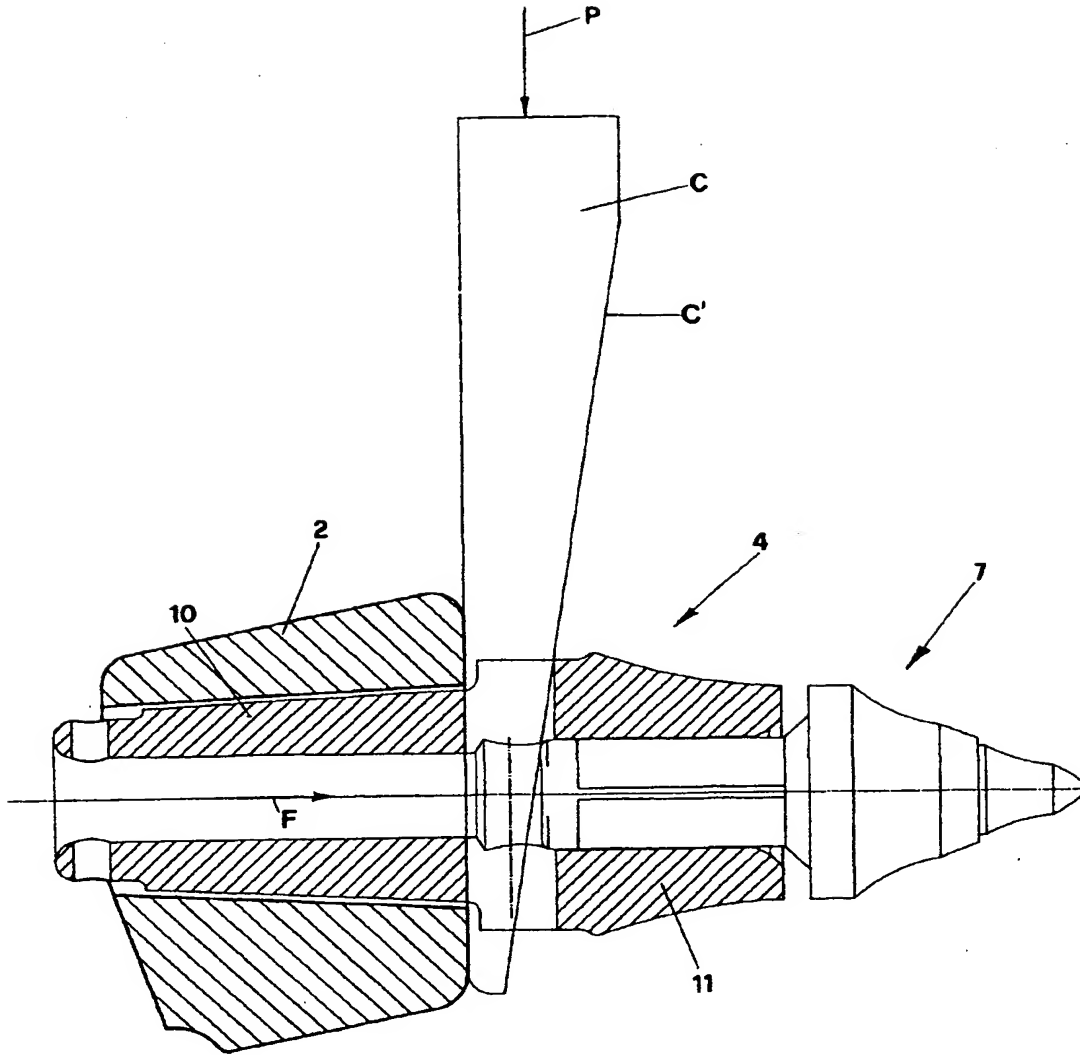


FIG.4